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Title: Risk of ALS and passive residential exposure to pesticides: a population based study

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Text:

Background and aims: Amyotrophic lateral sclerosis (ALS) is a progressive neurodegenerative disease of the motor neuron. Its etiology is still unknown, but environmental factors as agricultural pesticides may play a possible role.

Methods: We carried out a population-based case-control study in the provinces of Modena, Reggio Emilia and Parma (Northern Italy) and Catania (Southern Italy). For each case diagnosed in that area from 1998 to 2011, four controls matched by sex, age and province of residence were randomly selected from the general population. We identified and geocoded subjects' historical residence within a Geographical Information System (GIS) database. To evaluate passive exposures to neurotoxic pesticides, we added to the GIS two land use models related to the 2000s and to the 1980s, focusing on an area of 100 meters around the residences. We computed the percentage of that area dedicated to different cultivations (vineyards, orchards, extensive arable farming and crops) for which potentially neurotoxic pesticides had been used, to assess passive exposure to these chemicals.

Results: We identified 703 ALS cases and 2737 matched controls, 1251 of which (including 254 cases) did not change residence over the entire study period. We computed the odds ratio (OR) associated with different land use through a conditional logistic regression model, dichotomizing subjects' exposure according to pesticide use in the surrounding area. For residences at time of diagnosis OR was 1.15 (95% confidence interval 0.73-1.79) for vineyards, 0.99 (0.70-1.39) for orchards and 0.95 (0.78-1.15) for extensive arable farming and crops. For historical residences ORs were 0.74 (0.50-1.11), 1.07 (0.73-1.58) and 1.00 (0.78-1.28), respectively.

Conclusions: Study results show little evidence of any association between passive exposure to potentially neurotoxic pesticides and risk of developing ALS.